SECRET

25X1A

NRO REVIEW COMPLETED

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23 July 1963

MEMORANDUM FOR THE RECORD

SUBJECT: Trip Report to [redacted] 25X1

New York, 19 July 1963

REFERENCE: Trip Report to [redacted] 8 July 1963 25X1

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1. Considerable progress has been made on Contract [redacted] which started on 3 June 1963. Contractor has begun to synthesize possible designs from the analytical study made at the inception of the project.

2. By the end of August 1963, it is expected that decision can be made relative to the merits and desirability of direct electron beam injection as against post-acceleration of the electron beam (Task Ia).

3. Basic information on electron beam modulation, cathode geometry, automatic control of the electron beam, pulsing, and wall effects proximity has been elicited by this month's study (Task Ib).

4. Development of electron beam centering and position of focus have been remarkable. These aspects have been made completely automatic and self regulating, and, once adjusted, will require no further attention for electron beam ejection through a hole less than 1 mm. in diameter.

5. Novel high voltage sources have been considered. One of the more promising of these is the 200 Kv. [redacted] 25X1 generator which weighs only a few pounds. It is expected

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that this generator could be run by a small air turbine in a pitot tube outside the fuselage. Several solid state high voltage generators are also being looked at in terms of reliability and low weight.

6. A tentative design of a plasma electron gun is emerging from the studies using automatic, self-regulating electron beam centering and focus positioning encased in thin-walled metal can, the diameter of which is something less than 12 and the length of which is less than 18 inches. At the present early stages of this design, the standby power required is about 300 watts and the pulsed power 5 Kw in the electron beam. Sufficient energy storage at low inductance for a 100 microsecond pulse at 5 Kw can be gotten from a ceramic dielectric within the container. By the end of August 1963, it is expected that it will be known whether the weight per plasma electron gun can be decreased from around 50 pounds to 25 pounds.

7. Contractor is preparing an ex-scope proposal for the study of rise time of the electron cloud and the power requirements required to get rise times of tenths of microseconds. It is expected that this experiment could be set up and completed before the middle of August 1963.

[redacted]

Engineering and Analysis Division
OSA-ED/R

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